



# LAB NEWS

The Newsletter of the USEPA Region 9 Laboratory  
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## Why is this Newsletter this Color?

### Laboratory Quality Assurance

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The word quality brings different images to the minds of different people. As it relates to laboratory data, that statement is also true. High quality data is the goal of any laboratory, but how the data is produced and how its quality is assessed is dependent on the intended use of the data. To that end, the EPA has established the DQO (Data Quality Objectives) Process, which is the systematic planning of all operations to insure that any environmental data collected is adequate for its intended use.

All data produced by the EPA Region 9 Lab is carefully reviewed in at least two separate review processes before it is released.

Clients who wish to submit samples to the Region 9 Laboratory must establish their DQOs and determine, through dialogue with the Regional Quality Assurance Program and the Laboratory, whether the service provided by the Laboratory will meet those objectives. The planning process will establish the quality control requirements that the laboratory must meet during the analysis of those samples.

The USEPA Region 9 Laboratory operates under what are recognized in the laboratory industry as good laboratory practice standards.

See QA pg. 2

### Waste Solvent Recycling Program

by Pierre Belanger  
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The EPA Region 9 Laboratory has been in operation, at its current location, since January 6, 1994. While the laboratory was under construction, management decided to purchase an Integrity 2000 High Purity Solvent Recovery System to recycle waste solvent. This system cost about \$23,000.00.

#### Waste Generation:

One important aspect to the Laboratory Pollution Prevention Program is the minimization of hazardous waste generated at the lab and shipped off-site for treatment and/or disposal. One of the largest waste streams generated at the lab is methylene chloride. Methylene chloride is primarily used to extract contaminants from either water, soil or tissues samples.

Problems encountered during the first two years of operation include: learning how to operate the distillation unit, establishing written standard operating procedures, developing a periodic maintenance schedule, trouble shooting and repairing the equipment during breakdowns and developing the experience to operate the unit efficiently.

#### Measuring Savings:

A number of parameters can be measured to evaluate the success of the solvent recycling program including: the cost to purchase new solvent, the cost to dispose of waste solvent and the cost to maintain the equipment. In addition, changes in yearly workload will affect how much chemical is used and thus recycled. For the purpose of this

See Recycling Pg. 2

### Educational Outreach

by Amy Wagner  
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One goal of the Region 9 Laboratory is to get involved in community outreach. The Region 9 Lab is not only a resource for the exchange of technical and scientific assistance within government but also serves the public. The laboratory has made a difference by enhancing environmental awareness and providing educational opportunities to the local communities in the past 5 years since the Region 9 Lab opened in Richmond.

#### Adopt-A-School

In 1997, Verde Elementary School in Richmond and Dover Elementary School in San Pablo were chosen for the Region 9 Adopt-A-School Program. One hundred 4th-6th graders came to the Region 9 Laboratory to participate in activities which included spawning sea urchins, counting bacteria, sampling groundwater wearing Tyvek suits, identifying native and invasive vegetation in nearby Meeker Slough, and watching a demonstration of metals analysis. Adopt-A-School

See Outreach Pg. 2

#### In This Issue

- ! Laboratory Quality Assurance
- ! Waste Recycling Program
- ! Outreach

#### (Cont.--Outreach)

activities with Dover and Verde Schools in 1998/1999 were expanded so that Art

Milton, STEP employee, presents environmental workshops to the classes before the Laboratory visit. The Laboratory visit allows students to participate in field activities by sampling water quality parameters and biological organisms in San Francisco Bay followed by laboratory identification of planktonic organisms. The students also participate in hands on activities in microbiology, chemistry and field sample collection. We have also taken our demonstrations on the road to various schools.

### Richmond Summer Youth Program

Region 9 Lab staff trained students, in the Richmond Summer Youth Program to collect sediment and water samples at the mouth of Wildcat Creek in San Pablo Bay on the BayKeeper boat. We also brought the high school students to the Lab for hands-on demonstrations of biological, chemical and field procedures.

### Why is this paper this color?

Why did we use this goldenrod paper? Because it is also pH paper! Just tear off a piece and dip it in a basic solution (baking soda in water) and watch it turn red. Then dip it in an acidic solution (dilute vinegar) and watch the paper turn back to yellow. We use this paper to show pH changes in many of our outreach activities.

### (Cont.-- Recycling)

discussion we will simply report the cost to replace the solvent that was recovered.

### Payback Time

During the first two years of operation, start up problems and equipment failures accounted for about 3 months

of down time for each of those years. In spite of the problems the distillation unit was able to recover about 77 percent of the solvent recycled which is estimated to have saved about \$7,000. per year. Solvent recovery during 1996-1998 averaged about 80 percent per year which is estimated to be an average yearly savings of \$9150.00. In summary, the savings from the recycling program paid for the distillation unit in about 2 1/2 years.

### (Cont.--QA)

Overall laboratory quality assurance practices are outlined in a Quality Assurance Plan. Specific operations and quality control requirements are stated in the Standard Operating Procedure (SOP) which governs each analysis. SOPs are based on reference methods



Integrity 2000 Solvent Recovery System

which, when necessary, have been approved by EPA.

Sampling is a key component of the entire analytical process, as the analysis can only represent the actual contents of the sample as received. Non-homogeneous, improperly preserved, or contaminated samples do not reflect the actual conditions of the material at the sample site. In most cases, sampling is conducted independently from the analytical operation. A good sampling plan and adequately trained sampling personnel are essential to help ensure the integrity of the samples and quality of the data.

In the field and laboratory, numerous quality control samples are employed to assess the entire analytical operation. Quality control samples such as travel blanks and equipment blanks can be used to help determine whether the sampling process has potentially impacted the data. Method blanks, instrument blanks, storage

blanks, and preparation blanks are used to determine if contamination occurs in the laboratory. Duplicate samples are taken and analyzed to demonstrate whether the laboratory can achieve precision from one analysis to the next. Matrix spikes give an indication as to whether there are matrix interferences, which may cause results to be inaccurate. Most instrumental analyses require preparation of an initial calibration curve and periodic continuing calibration checks to verify that instrument operation is within specified limits. Laboratory control samples are also used to indicate that the analytical operation is in control. If any of the quality control limits are exceeded, corrective action is taken and a reanalysis of the affected samples may be performed. Failed quality control parameters do not necessarily mean the data is inferior and not usable. The results of quality control samples have to be evaluated as a whole and with the DQOs in mind. Flagging the data or identifying any analytical deficiencies lets the client know that there were analytical uncertainties.

All data produced by the Region 9 Lab is carefully reviewed in at least two separate review processes before it is released. Most of the data is then reviewed by the Quality Assurance Program. The review process is a complete and thorough look at all the raw data, confirmation of all results, and is culminated in a final report to the client which documents and evaluates any analytical uncertainty contained in the data package.



Children at R9 Lab Dressed in Tyvek